A pinout cross reference table is provided showing the relationship between the serial port and the X.21 interface. A DE-15 to DB-15 adapter cable is provided.

| X.21 DB-15 PIN | Serial Port DE-15 PIN | Signal Name | Interchange Circuit (AKA) | Direction | | Notes |
|---|---|---|---|---|---|---|
| | | | | DTE | DCE | |
| 2<br>9 | 11<br>1 | Transmit +<br>Transmit - | T<br>(TXD) | IN | OUT | |
| 3<br>10 | 2<br>7 | Control +<br>Control - | C<br>(RTS) | IN | OUT | |
| 4<br>11 | 8<br>12 | Receive +<br>Receive - | R<br>(RXD) | OUT | IN | |
| 5<br>12 | 13<br>3 | Indication +<br>Indication - | I<br>(CTS) | OUT | IN | |
| 6<br>13 | 4<br>9 | Signal Element Timing +<br>Signal Element Timing - | S<br>(RXC) | OUT | IN | |
| 7<br>14 | 10<br>14 | DTE Signal Element Timing +<br>DTE Signal Element Timing - | X<br>(TXC) | IN | OUT | |
| 1 | 6 | Shield Ground | Sheild | N/A | | Connect to Chassis Ground |
| 8 | 15 | Signal Ground | G<br>(GND) | N/A | | Connect to Logic Ground |
| 15 | 5 | N/A | | | | Spare Pin |

## 3) VERIFY OPERATION

Once the module has been installed and configured per steps 1 and 2, verify the module is operational by viewing the LED indicators.

The Power LED indicates the module is receiving power.

The Fiber Optic link LED indicates the fiber optic connection has been established.

Verify the serial port is configured for the correct mode of operation. Check the DCE/DTE and TD/RD LEDs.

| LED Function "Legend" | Color | OFF State | ON State |
|---|---|---|---|
| Power "Pwr" | Green | No power | Module has power |
| Fiber Optics "P1" | Green | No Fiber Link | On: Fiber signal detected<br>Blinking: Activity |
| Fiber Optics "Err" | Amber | No error detected | Error detected on fiber<br>(No clock or corrupted messages) |
| Serial Port "DCE" | Green | Not configured for DCE-facing | Configured for connection to a DCE device |
| Serial Port "DTE" | Green | Not configured for DTE-facing | Configured for connection to a DTE device |
| Timming Mode "TD/RD" | Green | No activity / No clock detected | Blinking: Activity |
| Loopback "Local LB"" | Amber | Loopback/Test mode not enabled | Blinking: Unit in loopback |

Form 040-08840-002 A 7/08

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**Omnitron Systems Technology, Inc.**

# *iConverter*® X21 Plug-in Module USER MANUAL

The Omnitron *iConverter*® X21 is a serial to fiber media converter featuring several configuration modes enabling connection to a wide variety of X.21 and RS-530 applications. Data rates of up to 8.192Mbps are supported.

The X21 supports standard DCE sourced timing and terminal timing modes. The included adapter cable accommodates different connector gender types. The X21 features local loopback on the serial and fiber ports to facilitate testing and installations.

## INSTALLATION PROCEDURE

1) Configure DIP-Switches

2) Install Module in the Chassis and Connect Cables

3) Verify Operation

## 1) CONFIGURE DIP-SWITCHES

### FRONT PANEL DIP-SWITCHES

#### SW1 - DCE/DTE

When this DIP-switch is in the “DCE” (default) position, the serial port is configured to connect to a DCE device. When the DIP-switch is in the “DTE” position, the serial port is configured to connect to a DTE device.

#### SW2 - SET CLOCK (RXC) POLARITY

When this DIP-switch is in the Receive Clock “RC” (default) position, the clock edge used to sample the data on the serial port is defined by the TIA/EIA-334-C specification. When the DIP-switch is in the Receive Clock Inverted “Inv” position, the data on the serial port is sampled on the inverted clock edge.

#### SW3 - DTE SET CLOCK (TXC) POLARITY

When Terminal Timing mode is enabled, this DIP-switch will determine the clock edge used to transfer data. When the DIP-switch is in the Terminal Timing Clock “TTC” (default) position, the clock edge used to sample the data on the serial port is defined by the TIA/EIA-334-C specification. When the DIP-switch is in the Terminal Timing Clock Inverted “Inv” position, the data on the serial port is sampled on the inverted clock edge.

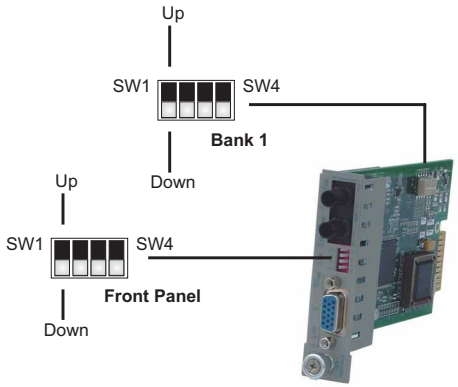


*Figure A: DIP-Switch Location*

### SW4 - LOOPBACK

When “L-LB” is selected, the serial port data signals are looped back to the attached device. At the same time, the fiber port is looped. If the module has Terminal Timing enabled (see DIP-SWITCH BANK 1), the clock signals are also looped back to the attached device.

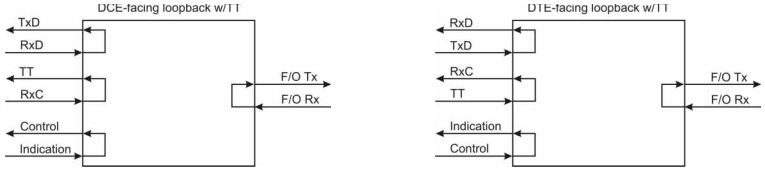


*Figure B: Loopback modes showing Terminal Timing*

| Switch | Down | Up |
|---|---|---|
| **SW1** | DCE:<br>DCE Interface enabled | DTE:<br>DTE Interface enabled |
| **SW2** | RC:<br>RXC Clock polarity normal | Inv:<br>RXC Clock polarity inverted |
| **SW3** | TTC:<br>TXC Clock polarity normal | Inv:<br>TXC Clock polarity inverted |
| **SW4** | Norm:<br>Loopback disabled | L-LB:<br>Loopback enabled |

## DIP-SWITCH BANK 1

### SW1 -TERMINAL TIMING

When this DIP-switch is in the Down (default) position, Terminal Timing is disabled. When this DIP-switch is in the Up position, Terminal Timing is enabled. When Terminal Timing disabled, it uses the ‘Signal Element Timing’ clock (SET clock, circuit S, X.21 pin pair 6, 13) as supplied by the DCE device to time Transmit data (TXD) and Receive data (RXD). This is called Contra-directional Timing. When Terminal Timing is enabled, it uses ‘DTE Signal Element Timing’ clock (DTE SET clock, circuit X, X.21 pin pair 7, 14) as supplied by the DTE device to time TXD, and uses ‘Signal Element Timing’ clock to time RXD. This is called Co-directional Timing.

When Terminal Timing is used, both the local and remote media converter must be set to use Terminal Timing, as well as the devices connected to each converter.

| Switch | Down | Up |
|---|---|---|
| **SW1** | Off: Terminal Timing disabled | On: Terminal Timing enabled |
| **SW2** | Off: Reserved | On: Reserved |
| **SW3** | Off: Reserved | On: Reserved |
| **SW4** | Off: Reserved | On: Reserved |

## 2) INSTALL MODULE IN CHASSIS AND CONNECT CABLES

a. Carefully slide the module into an open slot in the chassis. Align the module with the installation guides and ensure that the module is firmly seated against the backplane. Secure the module by fastening the front panel thumbscrew (push in and turn clockwise to tighten) to the chassis front. Verify the “Pwr” LED is ON (indicating the chassis is powered).

b. When using the SFP model (8859-0), insert the SFP Fiber transceiver into the Port 1 SFP receptacle on the X21 converter (see the SFP Data Sheet 091-17000-001 for supported transceivers).

**NOTE: The release latch of the SFP Fiber transceiver must be in the closed (up) position before insertion.**

c. Connect the included adapter cable to the serial port on the X21 converter. Use the appropriate gender plug to attach the X.21 device.

d. Connect an appropriate multimode or single-mode fiber cable to the fiber port of the installed module. It is important to ensure that the transmit (TX) is attached to the receive side of the device at the other end and the receive (RX) is attached to the transmit side. Single-fiber (SF) media converter models operate in pairs. The TX wavelength must match the RX wavelength at the other end and the RX wavelength must match the TX wavelength at the other end

### SERIAL PORT CONNECTOR

The serial port is a DE-15 female connector with the following pin-out configuration:

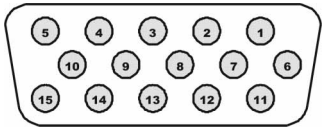


*Figure C: Serial Port DE-15 Connector*

The X.21 interface is a 2 row DB-15 connector.

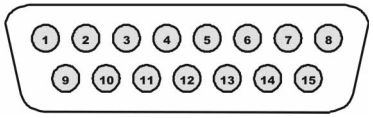


*Figure D: X.21 DB-15 Interface*